Permit Number:_____
*(to be provided by DWQ)*

NCDENR

DIVISION OF WATER QUALITY DWQ

STORMWATER MANAGEMENT PERMIT APPLICATION FORM
401 CERTIFICATION APPLICATION FORM

# CONTECH® STORMFILTER SUPPLEMENT

ENGINEERED SOLUTIONS

*This form must be filled out on line, printed and submitted with all of the required information.*
*Make sure to also fill out and submit the Required Items Checklist (Section III) and the I&M Agreement (Section IV)*

## I. PROJECT INFORMATION

| | |
|---|---|
| Project name | Hotel Indigo |
| Contact name | Howard Resnik |
| Phone number | 910-791-4441 |
| Date | October 30, 2012 |
| Drainage area number | 1 |

## II. DESIGN INFORMATION

**Site Characteristics**

| | | | |
|---|---|---|---|
| Drainage area ($A_D$) | 51,772.00 | $ft^2$ ✓ | OK |
| Impervious area | 48,508.00 | $ft^2$ ✓ | |
| % Impervious ($I_A$) | 93.7% | % ✓ | |
| Design rainfall depth ($R_D$) | 1.50 | in ✓ | |

**Peak Flow Calculations**

| | | | |
|---|---|---|---|
| 1-yr, 24-hr runoff depth | 3.83 | in ✓ | |
| 1-yr, 24-hr intensity | 0.16 | in/hr | |
| Pre-development 1-yr, 24-hr runoff | 827.00 | $ft^3$/sec | |
| Post-development 1-yr, 24-hr runoff | 14,724.00 | $ft^3$/sec | |
| Pre/Post 1-yr, 24-hr peak control | 13,897.00 | $ft^3$/sec | |

**Storage Volume**

| | | | |
|---|---|---|---|
| Design volume (WQV) | 13,826.00 | $ft^3$ | 13897 |
| Adjusted water quality volume ($WQV_{Adj}$) | 10,369.50 | $ft^3$ | 10422.25 OK |
| Volume contained before filter | 10,468.00 | $ft^3$ | |
| Runoff Coefficient ($R_V$) | 0.89 | (unitless) | |
| Pretreatment credit (estimated or calculated), %pre | 30.00% | | How is this being determined |

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**Mass loading calculations**

| | | | |
|---|---|---|---|
| Mean Annual Rainfall, P | 45.00 | in | 57.14 |
| Agency required % removal | 85.00% | | |
| Percent Runoff Capture (% capture) | 98.00% | | |
| Mean Annual Runoff, $V_t$ | 169953.32 | $ft^3$ | =P*Ad*Rv*(43560/12)*%capture |
| Event Mean Concentration of Pollutant, EMC | 70.00 | mg/l | (Suggestion: Use 60 for residential, 70 for Commercial, 100 fc |
| Annual Mass Load, $M_{total}$ | 742.24 | lbs | =EMC*Vt*(28.3)*(0.000001)*(2.2046) |

**Filter System**

| | | | |
|---|---|---|---|
| Cartridge height | 18.00 | in | |
| Specific Flow Rate, q | 1.00 | gpm/$ft^2$ | |
| SHWT elevation | 13.70 | ft amsl | |
| Bottom of the StormFilter vault elevation | 14.70 | ft amsl | |
| Clearance ($d_{SHWT}$) | 1.00 | | |
| Time to drain the StormFilter (t) | 8.00 | hours | Insufficient drainage time. |
| Time to drain the StormFilter (t) | 0.33 | days | |

**Cartridge Quantity Calculation**

| | | | |
|---|---|---|---|
| Mass removed by pretreatment system, $M_{pre}$ | 222.67 | lbs | =Mtotal * %removal |
| Mass load to filters after pretreatment, $M_{pass1}$ | 519.57 | lbs | =Mtotal - Mpre |
| Estimate the required filter efficiency, $E_{filter}$ | 0.79 | | =1+(%removal - 1)/(1 - %pre) |

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| | | | |
|---|---|---|---|
| Mass to be captured by filters, $M_{filter}$ | 408.23 | lbs | =Mpass1 * Efilter |
| Maximum Cartridge Flow rate, $Q_{cart}$ | 7.50 | gpm | =q * (7.5 ft2/cartridge) |
| Mass load per cartridge, $M_{cart}$ (lbs) | 36.00 | lbs | =lookup mass load per cartridge |
| Number of Cartridges required, $N_{mass}$ | 12.00 | | =ROUNDUP(Mfilter/Mcart,0) |
| Maximum Treatment Capacity | 0.20 | | =Nmass*(Qcart/449) |

**SUMMARY**

| | |
|---|---|
| Maximum Treatment Flow Rate, cfs | 0.20 |
| Cartridge Flow Rate, gpm | 7.50 |
| Number of Cartridges | 12.00 |

**Additional Information**

| | | | |
|---|---|---|---|
| Does volume in excess of the design volume bypass the filter? | y | Y or N | OK |
| Is an off-line flow-splitting device used? | y | Y or N | OK |
| If draining to SA waters: Does volume in excess of the design volume flow evenly distributed through a vegetated filter? | n | Y or N | Excess volume must pass through filter. |
| What is the length of the vegetated filter? | | ft | |
| Does the design use a level spreader to evenly distribute flow? | | Y or N | |
| Is the BMP located at least 30ft from surface waters (50ft if SA waters)? | y | Y or N | OK |
| If not a closed bottom, is BMP located at least 100ft from water supply wells? | y | Y or N | OK |
| Are the vegetated side slopes equal to or less than 3:1 | y | Y or N | OK |
| Is the BMP located in a recorded drainage easement with a recorded access easement to a public Right of Way (ROW)? | y | Y or N | OK |